



# “Forum on Spectrum Management Policy Reform”

National Academy of Science, Computer  
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# Overview

- FCC's & WTB's Spectrum "Management" Goals
- Key Ingredients for Successful Spectrum Management
- Current Challenges and Future Promises
  - Access to Spectrum is Key
  - Reexamining the Public Safety "Business Model"



# Spectrum “Management” Goals

## TRANSPARENCY → EFFICIENCY → RELIABILITY

- Promote the **highest and best use of spectrum** domestically and internationally in order to encourage the growth and rapid deployment of **innovative** and **efficient** wireless communications technologies and services.
- Advance **spectrum reform** by developing and implementing **market-oriented** allocation and assignment policies.
- Vigorously protect against **harmful interference** and enforce public safety-related rules.
- Conduct **effective and timely licensing activities** that encourage efficient use of the spectrum.
- Provide adequate **spectrum** and improve **interoperability** for better public safety and commercial purposes

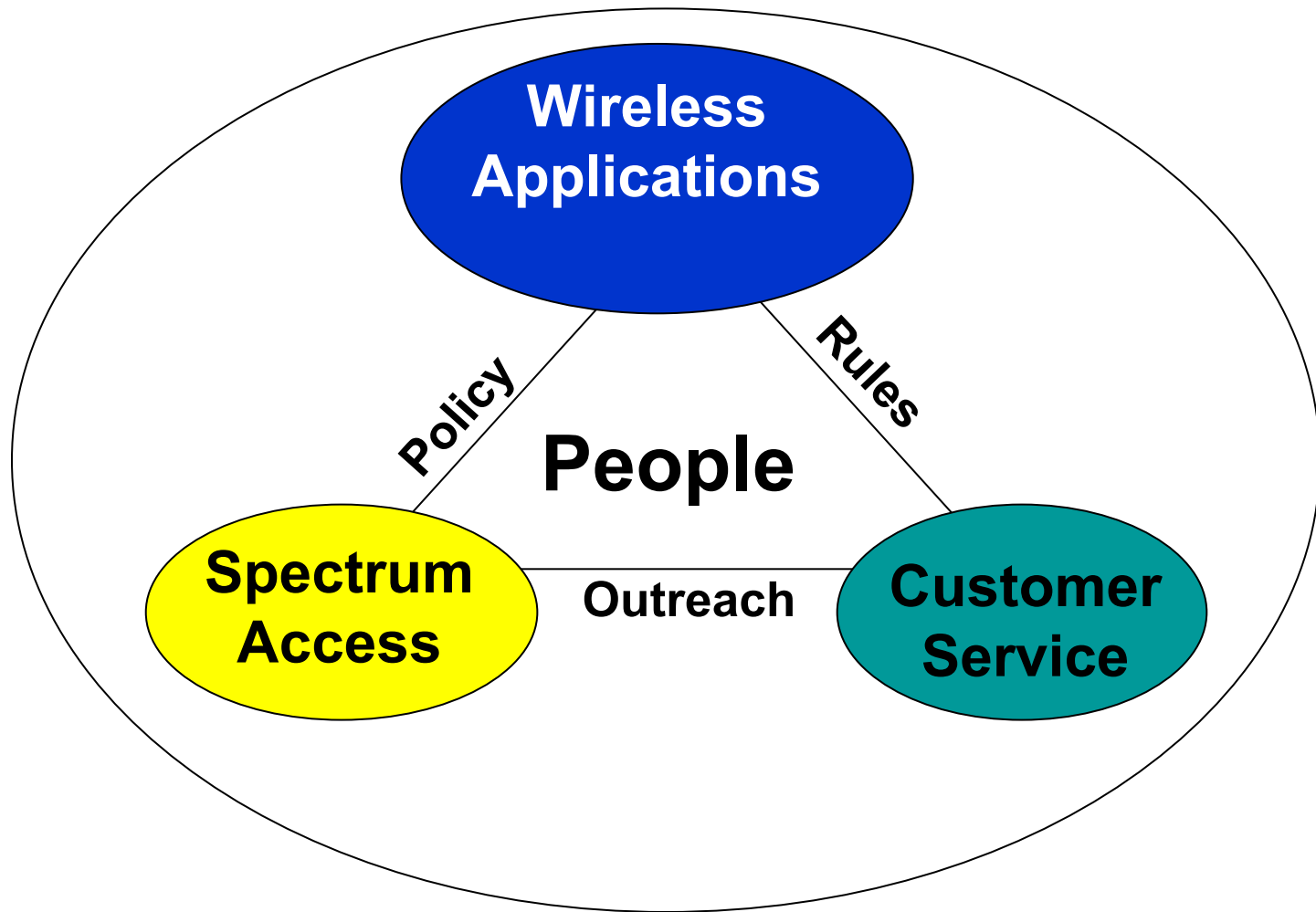


## **WIRELESS BUREAU OBJECTIVES**

- Increase the consumer good to produce economic growth by the deployment of spectrum based services
- Foster US global competitiveness through the use of spectrum services
- Greater emphasis on public safety and homeland security issues through the use of spectrum services
- Focus on excellent customer service to benefit our licensees and consumers.

# **FCC** Spectrum “Management” Vision

## **FOCUS OF OUR EFFORTS**





# Spectrum "Management" Success

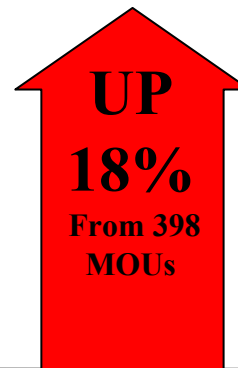
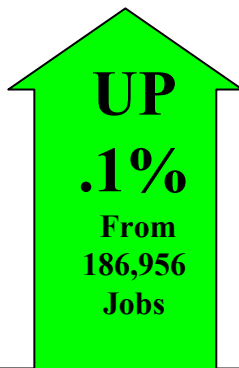
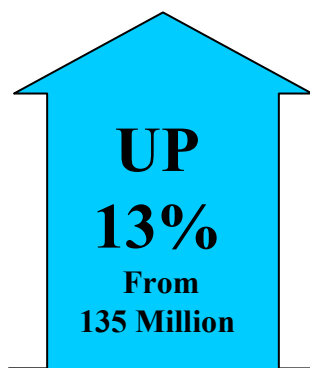
Success Speaks for Itself!  
Mobile Telephony: June 2002 – June 2003

**152 Million  
Subscribers in  
2003**

**187,169 Jobs in  
2003**

**\$134 Billion  
Invested as of  
2003**

**470 Average  
Monthly MOUs  
in 2003**



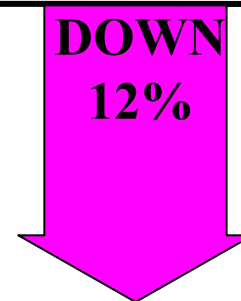
**Price  
per  
minute**

**Subscribers**

**Jobs**

**Capital  
Investment**

**Minutes  
of Use**



**10.5 cents Per  
Minute in 2003**

Source: Cellular Telecommunications & Internet Association; FCC. Subscriber comparison uses CTIA estimate for June 2002 and FCC estimate for June 2003. June 2003 MOU estimate is preliminary.



## SUCCESSFUL SPECTRUM MANAGEMENT

- Rapid transition of spectrum to highest and best uses  
**(transparent process)**
  - *Since the inception of the Auctions program, bidders have won 25,488 licenses and paid over \$14.4 billion to the U.S. Treasury*
- Flexible service rules foster facilities-based competition and adaptable to market conditions **(effective process)**
- Incentive based regulations favoring private transactions as a default **(reliable process)**



# Improving Spectrum Access

## FCC's Spectrum Policy Task Force Principal Findings:

- ***Spectrum access is a much more significant problem than scarcity.***
- Spectrum can be parceled and accessed in multiple dimensions (if our rules just let the technology do it).
- Technological innovations are allowing digital radio systems to be much smarter and more tolerant to interference.
- Spectrum users' rights and responsibilities need to be clearly defined.
- Transition traditional command-and-control bands to “exclusive use” and “commons” models.



## **Increasing Market Access Through Flexibility**

- 2003: FCC's Action in Secondary Markets Proceeding
  - Authorizes spectrum leasing in a broad array of wireless radio services
  - Leasing fosters flexibility and affords more opportunities to access spectrum for small businesses and in rural areas.
  - Pending proposals to expand leasing policies.
- Increased flexibility and innovation in FCC licensing, technical and operational policies.



# Reexamining the Public Safety “Business Model”

## Traditional set-aside, self-provisioning model

- 97 MHz of Spectrum Designated for Exclusive Public Safety Use (land mobile and fixed microwave platforms; not satellite).
- Bands and systems around for decades.
- Frequency coordinators.
- Typically high powered, high-sight broadcast architecture for each state/local agency's own internal use.
- Agencies with very limited, taxpayer funded budgets.
- Approximately 40,000 FCC “Public Safety” licensees.
- Comfortable with “command and control” structures
- Compare:
  - 190 MHz used/available for Commercial Mobile Radio Services and 150 mm consumers
  - 90 MHz becoming available in AWS.
  - Cellular architecture: frequency reuse; geographic licensing; lower powered/low sights.
  - New equipment and networks; highly competitive suppliers.



# Reexamining the Public Safety “Business Model”

## **Traditional set-aside, self-provisioning model**

- Advantages
  - Network availability, reliability and control
  - Exclusive frequencies
- Disadvantages
  - Slow deployment
  - Interoperability problems
  - Technological isolation
  - Capacity limitations



# Reexamining the Public Safety “Business Model”

## Recent Developments

- Pre-CMRS (before 1982) – public safety land mobile radio benefited from similarities with private radio (business, industrial and land transportation) in neighboring bands
  - Economies of scale, technological developments, standards, etc.
- Explosion of CMRS and unlicensed systems – result of greater regulatory flexibility, rapid development of technology, greater access to spectrum.
- **CHOICE! OPTIONS! COMPETITION! INFRASTRUCTURE!**
  - **Question Presented:** Is public safety taking full advantage of these developments and how can better spectrum policies facilitate more choice and flexibility and less regulation?



# Current Challenges and Future Promises

- Translating the benefits of “commercial” networks to the public safety realm.
  - Empowering Public Safety to Have “Dream Systems.”
- Encouraging the commercial world to leverage infrastructure for the benefit of public safety.
  - e.g., Priority Access; Interruptible Spectrum.
- Identifying creative public-commercial/private partnerships and best practices to solve public safety network challenges.



# Current Challenges and Future Promises

## Exploring New Ideas

- Reexamine the business model paradigm of public safety self-provisioning on spectrum set-asides.
- Examine options for public safety spectrum lease with “take-backs” (Secondary Markets FNPRM) and “preemptible” use of spectrum by “smart” radios and networks.
- Evaluate use of national virtual private networks on commercial networks dedicated to public safety use.
- Public safety communications system should:
  - Be scaleable
  - Be standards-based
  - Provide for vendor choice



Thank You!